

REMARKS

Claim 1 has been amended to recite that the tetrafluoroethylene polymer aqueous dispersion is obtained by carrying out a tetrafluoroethylene emulsion polymerization in an aqueous medium in the presence of a fluorovinyl group-containing emulsifier. Emulsion polymerization is an essential step in obtaining an aqueous as dispersion discussed in detail below. See also page 31, lines 28-30 of the specification.

Withdrawn independent method claim 11 has been amended to include all of the limitations of product claim 1. If product claim 1 is found to be allowable, Applicants respectfully request rejoinder of method claims 11 and 12 pursuant to MPEP § 821.04.

No new matter is added. Entry of the Amendment is respectfully requested.

Upon entry of the Amendment, claims 1, 4 and 7-12 are all the claims pending in the application. Claims 9-12 are withdrawn.

Review and reconsideration on the merits are requested.

1. The Invention

Present claim 1 is directed to a tetrafluoroethylene polymer aqueous dispersion obtained by carrying out a tetrafluoroethylene emulsion polymerization in an aqueous medium in the presence of a fluorovinyl group-containing emulsifier. The fluorovinyl group-containing emulsifier comprises a fluorovinyl group-containing compound (V):



wherein f represents an integer of 0 to 10 and Y represents $-\text{SO}_3\text{M}$ or $-\text{COOM}$ in which M represents H, NH_4 or an alkali metal.

The tetrafluoroethylene polymer aqueous dispersion has a fluorine-containing surfactant content of not higher than 50 ppm by mass.

Furthermore, the tetrafluoroethylene polymer is a perfluoro-based polymer and has a tetrafluoroethylene unit content exceeding 60 mole percent.

Claims 1, 4 and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Araki et al. (U.S. Patent No. 5,670,593; “Araki”).

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Araki in view of Hirashima et al. (U.S. Patent No. 5,856,392; “Hirashima”), and further in view of Araki et al. (WO 95-08598A, the English equivalent is US 5,925,705).

Applicants respectfully traverse, and respond to the Examiner’s comments (A), (C) and (D) as set forth at pages 5-7 of the Office Action as follows.

2. Response to Examiner’s Comment (A)

The Examiner considered that Araki does not teach away from using the claimed fluorovinyl group-containing compound (V) in the polymerization process of tetrafluoroethylene.

However, Araki does not disclose the specific polymerization for producing a perfluoro-based polymer having a TFE unit content exceeding 60 mole percent.

It is not obvious to use the claimed fluorovinyl group-containing compound (V) for producing a polymer having a TFE unit content exceeding 60 mole percent since the compound (V) was known as an impurity.

3. Response to Examiner’s Comment (C)

The Examiner considered that substituting N-1-OH for N-1-COOH or N-1-COONH₄ would have been obvious.

However, N-1-OH is not an emulsifier, but rather is a monomer for providing a fluorine-containing polymer having a functional group.

The polymerization of TFE, PPVE and N-1-OH is a suspension polymerization and does not provide a TFE polymer dispersion. In other words, Examples 33-35 disclose suspension polymerization. The suspension particles are collected directly from the reaction vessel.

In contrast, emulsion polymerization provides a dispersion.

N-1-OH is distinctly different than N-1-COOH, especially when emulsifying agents are not used.

4. Response to Examiner's Comment (D)

The Examiner considered that whether the polymerization process of Examples 33-35 is an emulsion or suspension polymerization process does not change the fact that the claimed TFE polymer aqueous dispersion is produced.

However, it is impossible to obtain a dispersion by suspension polymerization.

Indeed, a dispersion was not obtained in Examples 33-35. White powder of 642 g was obtained by treating in the same manner as in Example 18. In Examples 14-18, Araki describes that “the precipitated solid was taken out” (col. 60, line 27) and “the copolymers of Example 18 were obtained by rinsing the obtained white powder with water” (col. 60, lines 52-53). There is no description relating to dispersion.

Further, in accordance with the Examiner's suggestion, Applicants have amended claim 1 to limit the claimed dispersion to one produced by emulsion polymerization.

In view of the amendment to the claims and the foregoing remarks, it is respectfully submitted that the present claims are patentable over the cited prior art, and withdrawal of the foregoing rejections is respectfully requested.

Withdrawal of all rejections, rejoinder of claims 11 and 12 and allowance of claims 1, 4, 7, 8, 11 and 12 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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